

REMARKS

This is a response to the Office Action mailed September 11, 2003, in which a three (3) month Shortened Statutory Period for Response has been set, due to expire December 11, 2003. There were three (3) independent claims and a total of twelve (12) claims paid for in the application. Claims 10-12 have been canceled and claims 1, 3 and 5 have been amended. No new claims have been added. No new matter has been added to the application. No fee for additional claims is due by way of this Amendment. The Commissioner is authorized to charge any additional fees due by way of this Amendment, or credit any overpayment to our Deposit Account No. 19-1090. Claims 1-9 are pending.

Election/Restrictions

Applicants acknowledge election of Group I, claims 1-9, by way of the Response to Restriction Requirement and Preliminary Amendment filed August 19, 2003. Applicants further acknowledge election of claims 1-4 for purposes of initial examination and respectfully request the Examiner to examine claims 5-9 within the context of this application should the Examiner consider claims 1-4 to constitute patentable subject matter.

Amendments to the Claims

Applicants have amended claims 1 and 5 to recite “*determining* the insulation resistance of the load circuit” rather than “*measuring* the insulation resistance of the load circuit.” (Emphasis added.) As described in more detail below, the insulation resistance of the load circuit may be determined, for example, from a measured bridge voltage. Accordingly, since the insulation resistance is not “measured” directly, Applicants submit that the term “determining” more accurately characterizes the present invention.

Rejection Under 35 U.S.C. §102(e)

Claims 1 and 4 were rejected under 35 U.S.C. § 102(e) as being anticipated by Hortop (U.S. Patent No. 6,582,840) for the reasons set forth on pages 1-2 of the Office Action.

Applicants respectfully disagree and request that, in light of the above amendments and following remarks, this ground of rejection be withdrawn.

As amended, claim 1 recites, *inter alia*, “determining the insulation resistance of the load circuit.” The insulation resistance of the load circuit is the resistance between the load lines and ground (*see* column 1, lines 39-50 of U.S. Patent No. 5,760,488 (the ‘488 patent), which is incorporated by reference into the present application).

As set forth in paragraphs [0008] and [0016], which reference the ‘488 patent, and as summarized below, the insulation resistance of the load circuit may be determined, for example, by means of an insulation monitoring device. As described in the ‘488 patent at column 4, lines 9-63, such an insulation monitoring device may measure a bridge voltage, which is then used to determine the insulation resistance. In such an embodiment, the insulation monitoring device consists of two stages: a first measuring-bridge balancing stage, and a second measurement-signal processing buffer amplifier stage. Within the first stage, a number of voltage dividers (R1/R2, R3/R4, R5/R6) and trimming potentiometers (P1, P2) connect load circuit lines (L+, L-) from the fuel cells (G1-G12) to the vehicle body potential (GND). A measuring bridge (R8, P2, R7) is connected between two of the voltage dividers (R3/R4, R5/R6), and an output voltage ( $U_a$ ) is measured across the bridge.

The output voltage ( $U_a$ ) indicates the presence of a defect in the load circuit lines (L+, L-), such as excessive leakage current or a change in insulation resistance. As long as there is no defect, no voltage appears at the measuring bridge (R8, P2, R7) since both input nodes are at 0V. When a defect occurs, however, the two load circuit voltages become asymmetrical relative to the zero potential, and a non-zero voltage appears at the measuring bridge (R8, P2, R7). The output voltage ( $U_a$ ) indicates deviations from the voltage balancing, and thus possible insulation resistance changes. *See* ‘488 patent at column 4, line 64 through column 5, line 12.

Applicants submit that Hortop does not disclose a method for determining coolant quality of a fuel cell system comprising determining the insulation resistance of the load circuit. As noted by the Examiner, Hortop discloses a method for determining the conductivity of the coolant in a fuel cell system, however, rather than disclosing a method in which such conductivity is determined from the insulation resistance of the load circuit, Hortop teaches, at

column 7, lines 6-55, a method in which the stack voltage and coolant voltage are measured and then used to calculate a first resistance  $R_1$ , which is then used to calculate the resistivity of the coolant and, using the known reciprocal relationship between conductivity and resistivity, the conductivity of the coolant.

As for the rejection of dependent claim 4, Applicants respectfully submit that, since this claim is dependent from and thus contains all the limitations of claim 1, it is patentable for the same reasons as set forth above.

Accordingly, in view of the above remarks, Applicants respectfully request that this ground of rejection be withdrawn.

Rejection Under 35 U.S.C. § 103(a)

Claims 2 and 3 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Hortop (U.S. Patent No. 6,582,840) as applied to claims 1 and 4. This rejection is based on the Examiner's conclusion that Hortop discloses the method of claim 1. However, as set forth above, Applicants submit that Hortop does not disclose a method for determining coolant quality of a fuel cell system comprising determining the insulation resistance of the load circuit, as provided in claim 1. Accordingly, for the reasons set forth above, Applicants submit that claims 2 and 3 are also allowable and request that this ground of rejection be withdrawn.

Conclusion

Overall, the cited reference does not teach or suggest the claimed features of the embodiments recited in independent claims 1 and 5, and thus such claims are allowable. Because the remaining claims depend from allowable independent claims 1 and 5, and also because they include additional limitations, such claims are likewise allowable. If the undersigned attorney has overlooked a relevant teaching in any of the references, the Examiner is requested to point out specifically where such teaching may be found.

In light of the above amendments and remarks, Applicants respectfully submit that all pending claims are allowable. Applicants, therefore, respectfully request that the

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Examiner reconsider this application and timely allow all pending claims. Examiner Yuan is encouraged to contact Ms. Wagner by telephone to discuss the above and any other distinctions between the claims and the applied references, if desired. If the Examiner notes any informalities in the claims, the Examiner is encouraged to contact Ms. Wagner by telephone to expediently correct such informalities.

Respectfully submitted,

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